Re: Mass balance calculation regarding proposed RDA, LLC limestone quarry

Andrew Herndon - NOAA Federal <andrew.herndon@noaa.gov>

Thu 7/12/2018 2:31 PM

RDA

To Rippy, Crystal <RIPPYCD@dhec.sc.gov>; Caswell, Brett <CASWELBM@dhec.sc.gov>;

Cc Karla Reece <karla.reece@noaa.gov>; Nick Farmer <nick.farmer@noaa.gov>;

Hi Crystal and Brett,

Thanks for sharing your analysis with me.

As you know, Section 7 of the Endangered Species Act (ESA) requires consultations for federal projects that may adversely affect ESA-listed species and designated critical habitat. As with any project, if no routes of effect can be identified, no consultation is required. Thus, a federal action agency must determine if there is potential route of effect from an increase in turbidity (TSS) from the proposed project. Without identifying a route of effect there's nothing to consult on under the ESA.

Based on the data you provided, and the three case-scenarios you've presented, it's unclear to me how an increase in turbidity (TSS) from the action would impact sturgeon occurring in the Black River or Atlantic sturgeon critical habitat. You mentioned the reported turbidity data shows background levels fluctuate from 1.2-80.7 mg/L. If those estimates are correct, and the proposed project will cause only a 0.1 mg/L change, I find it highly unlikely a sturgeon would even be able to detect such a change relative to naturally occurring conditions. If the animal is unlikely to be able to detect the potential change, it's unclear to me how the change would cause an effect requiring consideration in a Section 7 consultation.

With respect to Atlantic sturgeon critical habitat in the Black River, 4 physical or biological features (PBFs) of the habitat have been identified. We believe these PBFs are essential to the conservation of the species (described below). While riverine habitats are important to all life stages of Atlantic sturgeon, from an ESA perspective, consideration of potential effects to Atlantic sturgeon critical habitat only considers how a project may affect those PBFs identified. As with effects to sturgeon, I fail to see how the potential change in turbidity of 0.1 mg/L will have any detectable effect on the 4 PBFs of Atlantic sturgeon critical habitat. Thus, as with the species, if no detectable impacts to 1 or more of those PBFs is anticipated, it's unclear to me how the requirements of Section 7 under the ESA are triggered.

Based on what you've provided, I don't see what route of effect a potential increase in turbidity (TSS) would cause to sturgeon or Atlantic sturgeon critical habitat. It's possible another route of effect that may adversely affect sturgeon or Atlantic sturgeon critical habitat exists, and if so, a consultation would be appropriate. But I'm unclear what would trigger a consultation requirement based on this information.

Physical and Biological Features of Atlantic Sturgeon Critical Habitat

(1) Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range) for settlement of fertilized eggs and refuge, growth, and development of early life stages;

(2) Aquatic habitat inclusive of waters with a gradual downstream gradient of 0.5 up to as high as 30 parts per thousand and soft substrate (e.g., sand, mud) between the river mouth and spawning sites for juvenile foraging and physiological development;

(3) Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support:

(i) Unimpeded movement of adults to and from spawning sites;

(ii) Seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary; and

(iii) Staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (at least 1.2 meters) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river;

(4) Water quality conditions, especially in the bottom meter of the water column, with temperature and oxygen values that support:

(i) Spawning;
(ii) Annual and inter-annual adult, subadult, larval, and juvenile survival; and
(iii) Larval, juvenile, and subadult growth, development, and recruitment. Appropriate temperature and oxygen values will vary interdependently, and depending on salinity in a particular habitat. For example, 6.0 mg/L dissolved oxygen or greater likely supports juvenile rearing habitat, whereas dissolved oxygen less than 5.0 mg/L for longer than 30 days is less likely to support rearing when water temperature is greater than 25°C. In temperatures greater than 26°C, dissolved oxygen greater than 4.3 mg/L is needed to protect survival and growth. Temperatures of 13 to 26 °C likely support spawning habitat.

On Thu, Jul 12, 2018 at 12:22 PM, Caswell, Brett <CASWELBM@dhec.sc.gov> wrote:

Hello Andy:

Please see the attached analysis regarding TSS and the pollutant's potential impact to the Atlantic sturgeon in the Black River.

We look forward to hearing what you think and as always, let me know if you have any questions.

Thanks,

Brett M. Caswell
Environmental Engineer, Industrial Wastewater Permitting
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4396
Connect: www.scdhec.gov Facebook Twitter

--

Andy Herndon
Atlantic and Shortnose Sturgeon Recovery Coordinator
Protected Resources Division
NOAA Fisheries - SERO
727-824-5367

Protect Sturgeon - Conserve Water, Protect Habitat, Report Sightings

Mass balance calculation regarding proposed RDA, LLC limestone quarry

Caswell, Brett

Thu 7/12/2018 12:23 PM

RDA

To: andrew.herndon@noaa.gov <andrew.herndon@noaa.gov>;

Cc: Rippy, Crystal <RIPPYCD@dhec.sc.gov>;

1 attachments (1 MB)

RDA Black River Mass Balance.docx;

Hello Andy:

Please see the attached analysis regarding TSS and the pollutant's potential impact to the Atlantic sturgeon in the Black River.

We look forward to hearing what you think and as always, let me know if you have any questions.

Thanks,

Brett M. Caswell
Environmental Engineer, Industrial Wastewater Permitting
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4396
Connect: www.scdhec.gov Facebook Twitter

With regard to the proposed RDA discharge to Murray Swamp and eventually the Black River, the following is an estimate of the impact we expect to see in the Black River as a result of the proposed limestone quarry to be owned and operated by RDA, LLC. The numbers we gathered generally represent the worst case of what we would ever expect to see, and in fact we believe the impact will be significantly lower than this. To quickly estimate the impact to the river, we simply do a mass balance around the discharge point. This expression is as follows:

$Q_U C_U + Q_E C_E = Q_D C_D$, where

Q_U = Average annual flow of the Black River upstream of the discharge;
C_U = Background concentration of TSS;
Q_E = Expected flow of the effluent from the quarry;
C_E = Concentration of TSS in the effluent;
Q_D = Downstream flow, and the sum of Q_U and Q_E;
C_D = The concentration downstream that we are seeking after the quarry effluent discharges to the river.

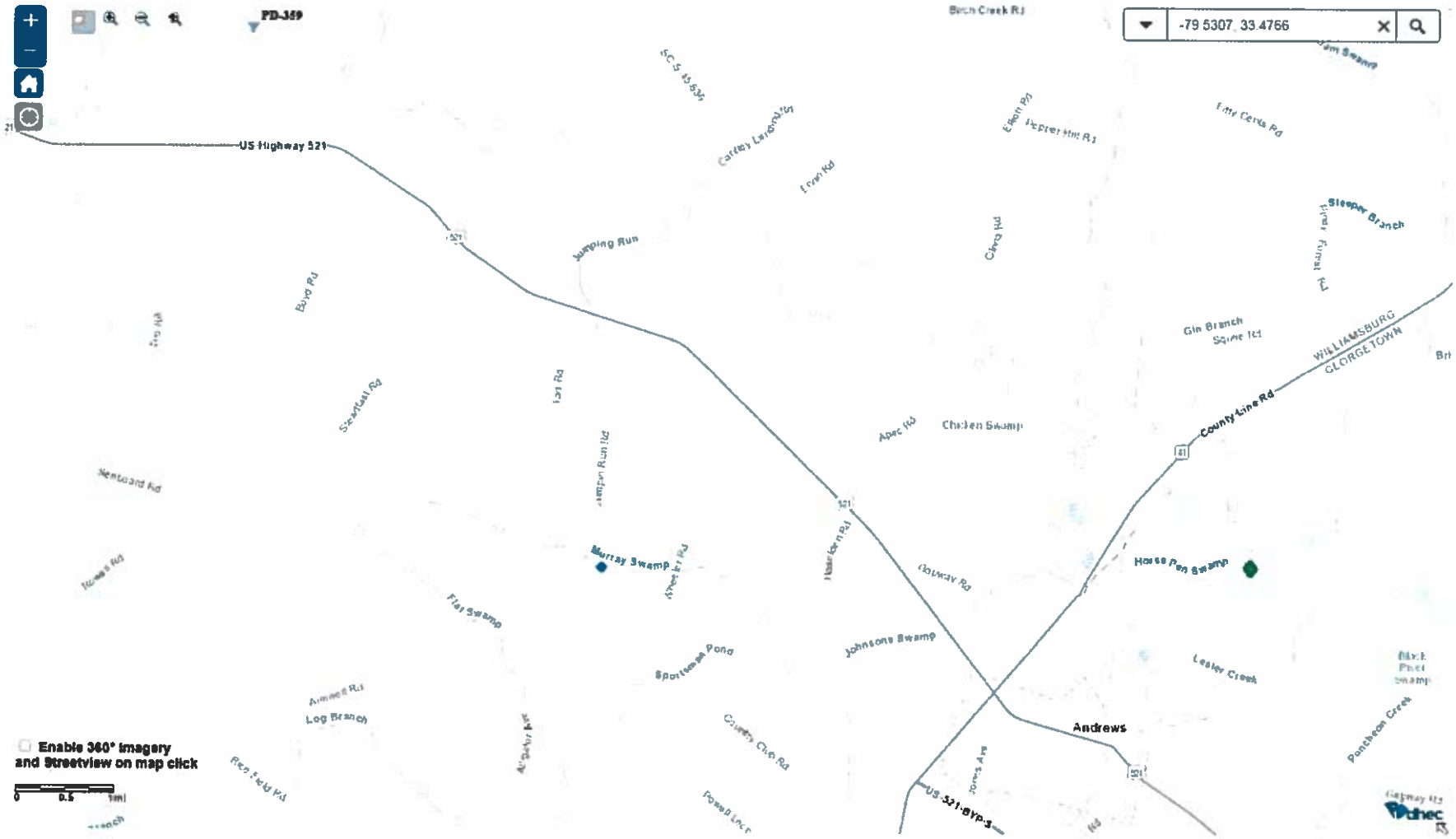
Since what we are looking for the concentration downstream, the expression can be rewritten to:

$C_D = (Q_U C_U + Q_E C_E)/Q_D$

For Q_U, we have from monitoring data a 7-year average of 934.1 cubic feet per second (cfs).

For C_U, there were actually three choices used for this parameter. In the first assumption, due to the pristine nature of the water (as so stated by many of the citizens of the area), we assumed a background of 1.0 mg/l (this is a standard assumption we use for our NPDES reviews in SC in the absence of any other data).

In the second assumption, we were able to obtain turbidity data from a water monitoring station on the Black River, PD-359. The location of this monitor is indicated by the light blue triangle in the map below. For reference, the proposed quarry discharge is indicated by the turquoise diamond near the center of the map, and the point of convergence of the swamp and the Black River that we are using for this mass balance calculation is indicated by the green diamond located on the right of the map.



The data obtained for PD-359 for turbidity from 2007 to 2017 indicate a maximum turbidity of 12 NTU during this period and a minimum of 1.2 NTU. However, to be useful in this analysis, a conversion from turbidity to pollutant concentration is necessary. We were able to locate a graph of these two parameters in a study from 1971 performed by Richard M. Duchrow and W. Harry Everhart who worked for the Department of Fishery and Wildlife Biology at Colorado State University. As you see in the graph below, regression equations were able to be derived from the data according to the type of sediment studied. For our purposes, I assumed "soil" as the chosen sediment in the river bed and computed a corresponding suspended sediment value in g/l, which was then multiplied by 1,000 to convert to mg/l.

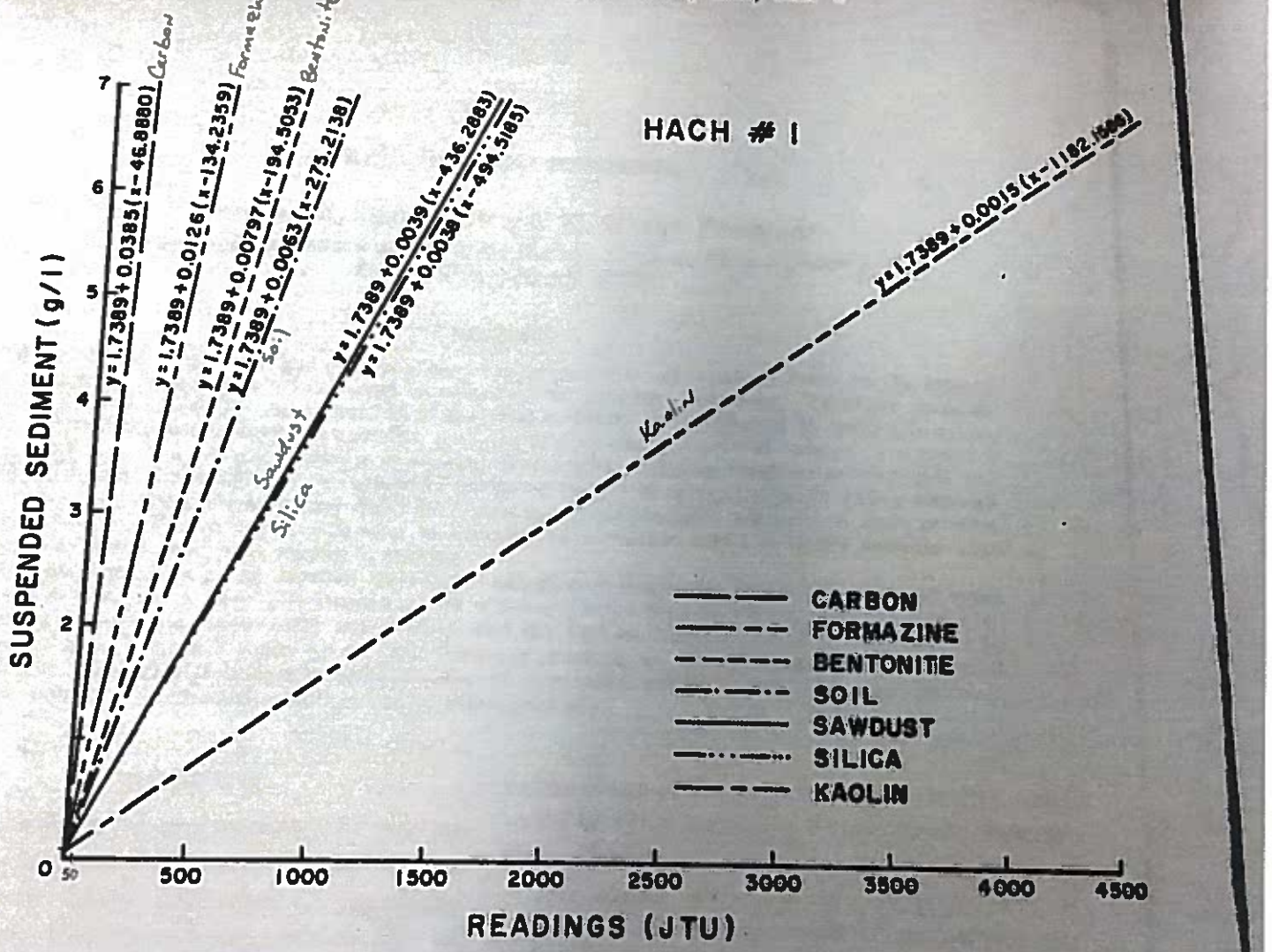


FIGURE 3.—Regression equations giving the relationships between turbidity readings (JTU) and weight of suspended solids (g/l) of seven materials for the first Hach model 2100 turbidimeter.

For a turbidity of 12, I calculated a C_U of 80.7 mg/l, and for a turbidity of 1.2, I calculated a C_U of 12.6 mg/l.

For Q_E, on the application the applicant has indicated they will discharge 2.5 million gallons per day (mgd), which converts to 3.9 cfs.

For C_E, I used the daily maximum permit limit of 45 mg/l as a worst case number.

And as mentioned above Q_D is the sum of the two flows, which yields 938 cfs. Therefore we are now ready to solve for the 3 possible values of C_U.

Case #1 - Assuming C_U of 1.0 mg/l:

$C_D = (Q_U C_U + Q_E C_E)/Q_D$

$C_D = ((934.1)(1) + (3.9)(45))/ 938 =$ **1.2 mg/l**

Case #2 - Assuming C_U of 12.6 mg/l:

$C_D = (Q_U C_U + Q_E C_E)/Q_D$

$C_D = ((934.1)(12.6) + (3.9)(45))/ 938 =$ **12.7 mg/l**

Case #3 - Assuming C_U of 80.6 mg/l:

$C_D = (Q_U C_U + Q_E C_E)/Q_D$

$C_D = ((934.1)(80.6) + (3.9)(45))/ 938 =$ **80.5 mg/l**

Therefore, what we conclude is that regardless of the actual value of the upstream concentration, the downstream concentration is practically unaffected by the quarry discharge.

Fwd: FW: Williamsburg - RDA LLC Mine - (effects on Atlantic sturgeon?)

Cynthia Cooksey - NOAA Federal <cynthia.cooksey@noaa.gov>

Fri 5/25/2018 11:06 AM

RDA

To Andrew Herndon - NOAA Federal <andrew.herndon@noaa.gov>; Rippy, Crystal <RIPPYCD@dhec.sc.gov>; Caswell, Brett <CASWELBM@dhec.sc.gov>; Koon, Joe <koonjm@dhec.sc.gov>; Litton, Joan F. <littonjf@dhec.sc.gov>; DeBessonet, Jeff <DEBESSJP@dhec.sc.gov>; Nick Farmer <nick.farmer@noaa.gov>;

Hi All,
As discussed during our call, and as a follow-up to Andy's May 24 email, below is a copy of the EFH habitat review I submitted to Lorianne Riggin on April 24.
Regards,
Cindy

New Office Number 843-460-9922*

Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service
Southeast Regional Office - Habitat Conservation Division
219 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

---------- Forwarded message ----------
From: **Cynthia Cooksey - NOAA Federal** <cynthia.cooksey@noaa.gov>
Date: Tue, Apr 24, 2018 at 11:48 AM
Subject: Re: FW: Williamsburg - RDA LLC Mine - (effects on Atlantic sturgeon?)
To: Lorianne Riggin <RigginL@dnr.sc.gov>
Cc: "pace.wilbur@noaa.gov" <pace.wilbur@noaa.gov>, Greg Mixon <MixonG@dnr.sc.gov>, Tom Daniel <DanielT@dnr.sc.gov>, Bill Post <PostB@dnr.sc.gov>

Hi Lorianne,
Pace is at a division meeting in St. Petersburg this week and may have limited communication. As I indicated in our call earlier today, the Sturgeon issue would be most appropriately addressed via a consultation with the NMFS Protected Resources Division. I previously downloaded and reviewed the RDA Mining application (Mine Permit I-002171) on August 18, 2017 for essential fish habitat (EFH) concerns. Given how far inland the mine is located that NMFS had no comments or conservation recommendations related to EFH at that time. I've just reviewed some of the newer documentation in the link you provided and I continue to have no EFH comments or conservation recommendations regarding the proposed mine.
Regards,
Cindy

New Office Number 843-460-9922*

Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service

Southeast Regional Office - Habitat Conservation Division
219 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

On Tue, Apr 24, 2018 at 8:50 AM, Lorianne Riggin <RigginL@dnr.sc.gov> wrote:

> Morning Pace,
>
> I mentioned the RDA Mine project to Cindy last week when I saw her at IRT, but I was wondering if you have been getting requests from Mr. Askins or others regarding Atlantic Sturgeon concerns for this project.
>
> Here is a direct link to the mine information: https://www.scdhec.gov/Environment/Quarry/RDAMine/
>
> Got a few minutes to chat this morning?
>
> Lorianne

Lorianne Riggin

Director, Office of Environmental Programs

South Carolina Department of Natural Resources

1000 Assembly Street, PO Box 167

Columbia, SC 29202

Office 803-734-4199

Cell 803-667-2488

www.dnr.sc.gov/environmental

From: Bill Post
Sent: Monday, April 23, 2018 5:21 PM
To: Lorianne Riggin <RigginL@dnr.sc.gov>; Shannon Bobertz <BobertzS@dnr.sc.gov>
Subject: Fwd: Williamsburg - RDA LLC Mine - (effects on Atlantic sturgeon?)

This message was sent using a mobile device, please excuse any errors.

Begin forwarded message:

From: "Tim Askins" <taskins@hotmail.com>
To: "Bill Marshall" <MarshallB@dnr.sc.gov>
Cc: "Ben@scwf.org" <Ben@scwf.org>, "SCOTT, GEOFFRY" <GISCOTT0@mailbox.sc.edu>, "Stan Barnett" <stan.barnett@yahoo.com>, "Bill Post" <PostB@dnr.sc.gov>
Subject: Re: Williamsburg - RDA LLC Mine - (effects on Atlantic sturgeon?)

Bill,

Please pass along to staff with a request for a reply.

It appears no effort has been made by anyone to evaluate the potential impacts to the endangered Atlantic Sturgeon or, for that matter, to other marine life from the discharge of up to 7.5 million gallons of ground water a day for decades into the Black River and its tributary, Johnson's Swamp. It is simply inconceivable that potential harm to our environment would be disregarded in this way. I ask that SCDNR voice an opinion for disapproval of this project until a thorough evaluation of the impacts to the Atlantic Sturgeon and other marine life is conducted and I suggest that as to the Atlantic Sturgeon, this should include formal consultation with the National Marine Fisheries Service.

In December 2017, a limestone mine permit was vacated by a North Carolina state court because the state agency which issued the permit had failed to adequately consider the impacts of the large amount of ground water which was to be pumped from the mine into a small creek adjacent to a coastal river. Dr. Anthony Overton, one of the experts who testified for the challengers of that permit, explained that certain marine organisms would be killed by the discharge of the ground water. He has recently confirmed to Mr. Stan Barnett personally that the discharge of such large volumes of ground water from a limestone mine are likely to cause changes in the streams into which they are pumped so that anadromous fish species, including the Atlantic Sturgeon, may sense changes in the streams deemed critical habitat where they historically spawn and fail to spawn at all in those waters. (Attached is the expert report he presented in the NC case detailing anticipated harm from the limestone mine proposed there).

Andrew Herndon is the expert on the Atlantic Sturgeon with NMFS for this region. He has authorized Stan Barnett to relay to you what was told in a lengthy conversation from Friday: Dr. Overton is correct that the discharge of the volumes of ground water predicted by RDA, given the size and nature of the receiving stream, is likely to cause changes in the characteristics of those waters which would be the type to cause the Atlantic Sturgeon to fail to spawn there – pH, chemical composition, temperature and suspended solids. This discharge may also impact the food source of the Sturgeon, he explained, through scouring action and flushing. Understanding the SCDNR has not verified spawning in the Black River these waters are yet deemed "Critical Habitat" and should be protected.

Mr. Herndon also confirmed that the Sturgeon most likely advances out of Black River and up Johnson's Swamp, taking it very near the mine site. It should not be surprising that Mr. Herndon and Dr. Overton believe that formal Section 7 consultation is the best way to determine what the impacts

to the Sturgeon would be. Failure to adequately consider impacts to the Atlantic Sturgeon – and from what I have seen, there has been no consideration at all at this point – would violate the Endangered Species Act.

I believe it is important to point out that the environmental portions of the RDA application were signed off on and submitted by a consultant who should not be accorded the same level of credence that SCDNR would normally afford. Kent Campbell, who signed the Nationwide Permit 44 application is now with Environs Design Studio, but he formerly had his own business. He closed that business after being sued by Grady County, Georgia for deliberately violating a mitigation project approval issued by the Savannah District and costing that county some $6.5 million. His willful violation of the Corps' approved mitigation project placed the county into an enforcement posture.

This information is only pertinent to the matter of the RDA application because that application as it was submitted to both DHEC and to the Corps are fatally flawed by two seminal misrepresentations: 1) it omits entirely reference to an endangered species present in both the Black River (part of its critical habitat) and in Johnson's Swamp; and 2) its cultural resource report blatantly misrepresents the history of the areas surrounding the mine site by wrongly claiming it was not settled until the late 1800s.

These misrepresentations, unless they have been remedied by independent agency investigations, render any decision made in reliance on them in violation of the obligations to properly consider impacts to endangered species and to cultural resources. I submit that when an application for a major project misrepresents two key components AND has been submitted by someone who was found by the Corps to have deliberately violated a significant mitigation project approved by that agency, there is good cause to stop treating that application as having any credibility at all in any respect. This would include any and all portions of the reports SCDNR has relied on to make comments with regards to the wildlife, threatened and endangered species and environmental impacts of this project.

Best Regards

Tim Askins

Re: Fw: Proposed Limestone Quarry near Andrews, SC

Andrew Herndon - NOAA Federal <andrew.herndon@noaa.gov>

Thu 5/24/2018 3:58 PM

To Rippy, Crystal <RIPPYCD@dhec.sc.gov>;

Cc Caswell, Brett <CASWELBM@dhec.sc.gov>; Koon, Joe <koonjm@dhec.sc.gov>; Litton, Joan F. <littonjf@dhec.sc.gov>; DeBessonet, Jeff <DEBESSJP@dhec.sc.gov>; Cynthia.Cooksey@noaa.gov <Cynthia.Cooksey@noaa.gov>; Nick Farmer <nick.farmer@noaa.gov>;

Hi All,

Thanks for your time this afternoon.

Just to follow-up on our conversation, following a closer review of the proposed project's location and the habitats surrounding that location, along with what we know about sturgeon behavior, I would not anticipate a sturgeon occurring at the site proposed for the RDA mine.

As we discussed, I believe a more relevant path of inquiry is what are the potential water quality effects to the Black River from the operation of the mine? Based on the proposed mine's location and discharge plan, it seems likely that at least some level of biofiltration will occur before discharges reach the Black River. I think it would be well worth the effort to try and determine what degree of filtration is likely to occur. If no detectable change in water quality at the Black River is likely to occur then it's tough to see how sturgeon would be effected. Conversely, if we do anticipate a measurable change in water quality, it would be good to know what that is so that we can have some idea of how biologically relevant it would be and what steps could be taken to minimize the impacts.

I look forward to speaking with you further next Wednesday.

Andy

From: Caswell, Brett
Sent: Tuesday, May 15, 2018 6:52 PM
To: Andy.Herndon@noaa.gov
Cc: Rippy, Crystal; Thompson, G. Randall
Subject: Proposed Limestone Quarry near Andrews, SC

Dear Mr. Herndon:

We received your name and contact information from Pace Wilber in the Charleston office and understand that you are the NOAA specialist responsible for endangered species (while Mr. Wilbur is over the critical habitat areas for the Carolinas). I work for the Department of Health and Environmental Control (DHEC), the state agency responsible for overseeing environmental permitting in South Carolina, and specifically with facilities who wish to obtain stormwater and/or wastewater coverage as it pertains to mining facilities. We have an applicant who is trying to obtain all relevant environmental permits to operate a limestone quarry in the lowcountry of South Carolina about 20 miles from the Atlantic Ocean. As part of our technical review it has come to our attention that while water from the proposed quarry would be discharged into a swamp near the site, this swamp eventually drains -- about 8 miles downstream -- into the Black River, which is a critical habitat for the federally endangered Atlantic sturgeon.

The permit coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges Associated with Nonmetal Mineral Mining Facilities would allow this quarry to discharge water from mine dewatering, process-generated wastewater and stormwater to Murray Swamp, which flows to Johnson's Swamp and then Horse Pen Swamp before reaching the Black River. The limits in the General Permit are technology-based and water quality-based limits which were derived based on SC Regulation 61-68. These standards are designed to protect water quality. The discharge would be subject to ***monthly*** monitoring for flow, total suspended solids (TSS) and pH, and would be subject to ***quarterly*** monitoring for oil and grease (O&G). The limits are as follows:

Flow:	Daily Maximum – Monitor & Report	Monthly Average – Monitor & Report
TSS:	Daily Maximum – 45 milligrams per liter	Monthly Average – 25 milligrams per liter
pH:	6.0 to 8.5 standard units	
O&G:	Daily Maximum – 15 milligrams per liter	Monthly Average – 10 milligrams per liter

The quarry must also have, and follow, a Stormwater Pollution Prevention Plan (SWPPP) that establishes Best Management Practices (BMPs) to effectively limit the amount of pollutants, mainly sediment, that are discharged from the site. To accomplish this, the facility proposes to route most of the stormwater into the pit for containment and settling. From there, a portable pump will transfer water to an on-site 9.9 acre sediment/retention pond located near Murray Swamp. When the retention pond is full, the water will discharge through the outfall into Murray Swamp. The application estimates that the total volume of water discharged will not exceed 2.2 million gallons per day.

Some of the water from the retention pond will be used to wash the stone removed from the mine. The wash water will be routed through a closed circuit series of clarification ponds to remove limestone fine particles prior to discharge back to the retention pond. As the retention ponds and clarification ponds become full of this material, the sediment and fine particles will be removed and back-filled into the pit.

Based on my understanding of the Atlantic sturgeon, their habitat can be degraded, disrupted or lost because of various human activities, such as dredging, dams, water withdrawals, saltwater intrusion, chemical contamination of sediments in rearing areas, and other development. Any activity that destroys those locations directly (e.g., dredging) or indirectly (e.g., sedimentation or saltwater intrusion) would negatively impact the Atlantic sturgeon habitat. To support all life stages, Atlantic sturgeon also require sufficient water quantities and water qualities sufficient to support all life stages, which are often impacted by the activities above.

Dredging, dams and chemical contamination will not take place as a result of this proposed quarry discharge. Based on the above process description, sedimentation will be greatly minimized when the proposed quarry does discharge, and should remain below permit limits. While groundwater will be necessarily withdrawn and discharged (via pit dewatering) from this proposed quarry, available surface water will actually increase, in theory helping the species. As I said earlier, the discharge from pit dewatering into the nearby swamp eventually connects to the Black River. However, we do not expect saltwater intrusion to be an issue not only because the proposed quarry site is about 20 miles from the nearest saltwater, but also because the complex soil conditions (e.g. the presence of clay and black mingo layers) yields no hydraulic connection between this area and the ocean.

Based on the information above, I would like to ask: do we as a permitting authority need to be concerned about this proposed quarry discharge negatively impacting the Atlantic sturgeon in any way? Thank you for your input!

Sincerely,

Brett M. Caswell
Environmental Engineer, Industrial Wastewater Permitting
S.C. Dept. of Health & Environmental Control